

# HN27C301A Series

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## 1M (128K x 8-bit) UV and OTP EPROM

### ■ DESCRIPTION

The Hitachi HN27C301A is a 1-Megabit Ultraviolet Erasable and One-Time Programmable Electrically Programmable Read Only Memory organized as 131,072 x 8-bits.

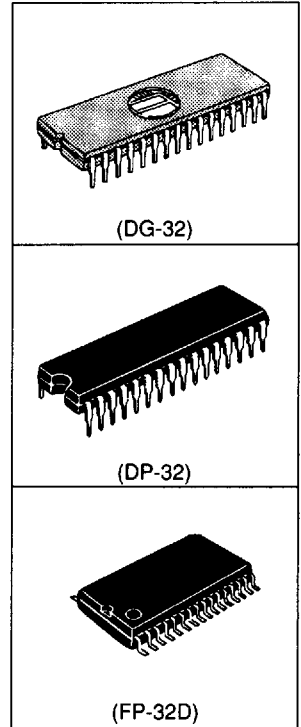
The HN27C301A features fast address access times and low power dissipation. This combination makes the HN27C301A suitable for high speed microcomputer systems. The HN27C301A offers high speed programming using page programming mode.

Hitachi's HN27C301A is offered in 32-pin Ceramic and Plastic DIPs and plastic SOP packages.

The Ceramic DIP package is erasable by exposure to Ultraviolet light. The Plastic DIP and SOP packaged devices are One-Time Programmable and once programmed, can not be rewritten.

### ■ FEATURES

- Fast Access Times:  
100 ns/120 ns/150 ns/200 ns (max)
- Single Power Supply:  
 $V_{CC} = 5 V \pm 10\%$
- Low Power Dissipation:  
Active Mode: 50 mW/MHz (typ)  
Standby Mode: 5  $\mu$ W (typ)
- High Speed Page and Word Programming:  
Page Programming Time: 14 sec (typ)
- Programming Power Supply:  
 $V_{PP} = 12.5 V \pm 0.3 V$
- Packages:  
32-pin Ceramic DIP  
32-pin Plastic DIP  
32-lead Plastic SOP



### ■ ORDERING INFORMATION

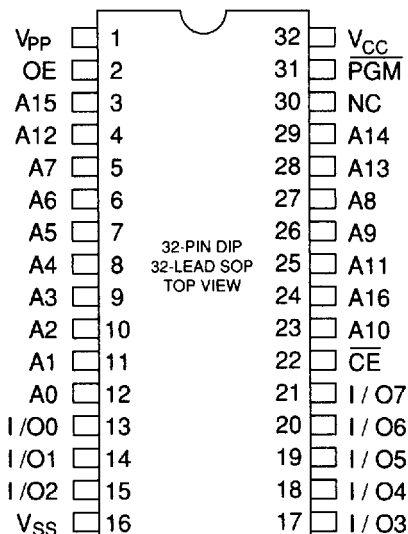
Type No.	Access Time	Package
HN27C301AG-10	100 ns	32-pin Ceramic DIP (DG-32)
HN27C301AG-12	120 ns	
HN27C301AG-15	150 ns	
HN27C301AG-20	200 ns	
HN27C301AP-12	120 ns	32-pin Plastic DIP (DP-32)
HN27C301AP-15	150 ns	
HN27C301AP-20	200 ns	
HN27C301AFP-12	120 ns	32-lead Plastic SOP (FP-32D)
HN27C301AFP-15	150 ns	
HN27C301AFP-20	200 ns	

## ■ PIN ARRANGEMENT

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HN27C301AG Series

HN27C301AP Series



(PinD32.HN27C301A)

## ■ PIN DESCRIPTION

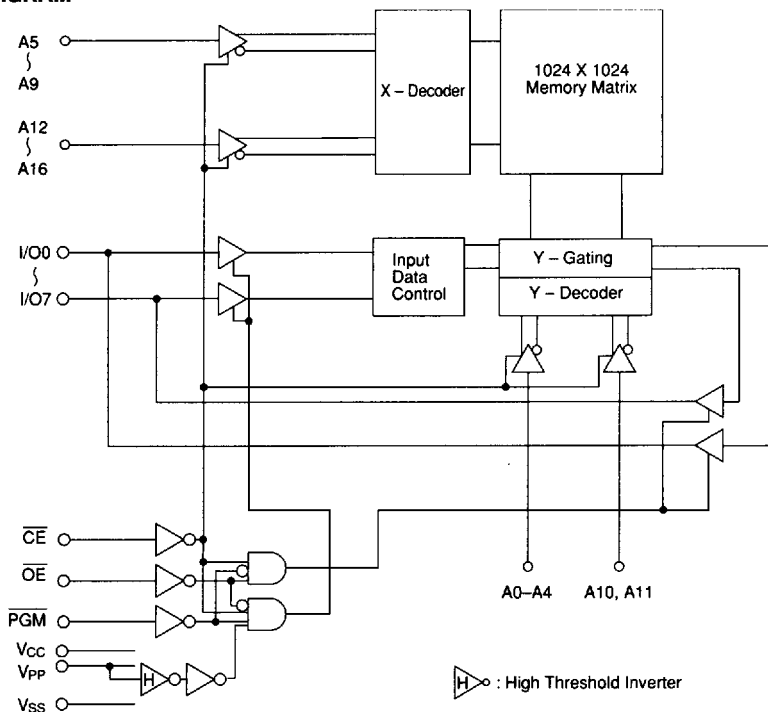
Pin Name	Function
$A_0 - A_{16}$	Address
$I/O_0 - I/O_7$	Input/Output
$\overline{CE}$	Chip Enable
$\overline{OE}$	Output Enable
$V_{CC}$	Power Supply
$V_{PP}$	Programming Supply
$V_{SS}$	Ground
PGM	Programming Enable
NC	No Connection

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## ■ BLOCK DIAGRAM



(BD.HN27C301A)

## ■ MODE SELECTION

Mode	$V_{PP}$	$V_{CC}$	$\overline{CE}$	$\overline{OE}$	$\overline{PGM}$	$A_9$	I/O
Read	$V_{CC}$	$V_{CC}$	$V_{IL}$	$V_{IL}$	$V_{IH}$	X <sup>1</sup>	$D_{OUT}$
Output Disable	$V_{CC}$	$V_{CC}$	$V_{IL}$	$V_{IH}$	$V_{IH}$	X	High-Z
Standby	$V_{CC}$	$V_{CC}$	$V_{IH}$	X	X	X	High-Z
Program	$V_{PP}$	$V_{CC}$	$V_{IL}$	$V_{IH}$	$V_{IL}$	X	$D_{IN}$
Program Verify	$V_{PP}$	$V_{CC}$	$V_{IL}$	$V_{IL}$	$V_{IH}$	X	$D_{OUT}$
Page Data Latch	$V_{PP}$	$V_{CC}$	$V_{IH}$	$V_{IL}$	$V_{IH}$	X	$D_{IN}$
Page Program	$V_{PP}$	$V_{CC}$	$V_{IH}$	$V_{IH}$	$V_{IL}$	X	High-Z
Program Inhibit	$V_{CC}$	$V_{CC}$	$V_{IL}$	$V_{IL}$	$V_{IL}$	X	High-Z
	$V_{PP}$	$V_{CC}$	$V_{IL}$	$V_{IH}$	$V_{IH}$	X	High-Z
	$V_{PP}$	$V_{CC}$	$V_{IH}$	$V_{IL}$	$V_{IL}$	X	High-Z
	$V_{PP}$	$V_{CC}$	$V_{IH}$	$V_{IH}$	$V_{IH}$	X	High-Z
Identifier	$V_{CC}$	$V_{CC}$	$V_{IL}$	$V_{IL}$	$V_{IL}$	$V_{IL}$	$D_{ID}$

- Notes: 1. X = Don't Care.  $V_{PP} = 0\text{ V to }V_{CC}$ .  
 2.  $11.5\text{ V} \leq V_H \leq 12.5\text{ V}$

■ **ELECTRICAL CHARACTERISTICS**  
REFER TO HN27C101A DATASHEET

■ **ERASING THE HN27C301A**

The Hitachi HN27C301A Ceramic DIP package allow the device to be erased by exposure to ultraviolet light of 2537Å. All of the data is changed to "1" after this erasure procedure. The minimum integrated dose (UV intensity x exposure time) for erasure is 15 W-sec/cm<sup>2</sup>.

■ **DEVICE IDENTIFIER MODE DESCRIPTION**

The Device Identifier Mode allows binary codes to be read from the outputs that identify the manufacturer and the type of device. Using this mode with programming equipment, the device will automatically match its own erase and programming algorithm.

■ **HN27C301A SERIES IDENTIFIER CODE**

Identifier	A <sub>0</sub>	I/O <sub>7</sub>	I/O <sub>6</sub>	I/O <sub>5</sub>	I/O <sub>4</sub>	I/O <sub>3</sub>	I/O <sub>2</sub>	I/O <sub>1</sub>	I/O <sub>0</sub>	Hex Data
Manufacturer Code	V <sub>IL</sub>	0	0	0	0	0	1	1	1	07
Device Code	V <sub>IH</sub>	1	0	1	1	1	0	0	1	B9

- Notes:
1. V<sub>CC</sub> = 5.0 V ± 10%
  2. A<sub>9</sub> = 12.0 V ± 0.5V
  3. A<sub>1</sub>-A<sub>8</sub>, A<sub>10</sub>-A<sub>16</sub>,  $\overline{CE}$ ,  $\overline{OE}$  = V<sub>IL</sub>,  $\overline{PGM}$  = V<sub>IH</sub>
  4. X = Don't Care

■ **HN27C301AP RECOMMENDED SCREENING CONDITIONS**

Before mounting the HN27C101AP, please make the following screening (baking without bias) shown below:

